HABITAT CONDITIONS

Channel Alterations

Channelization and levee construction were once a widely used and accepted technique in stream management in Missouri, especially in the more productive agricultural areas such as the Platte River basin. The objectives of channelization were to reduce floods by permitting more rapid run-off of precipitation and to facilitate drainage of low-lying agricultural land. Levees were also constructed to eliminate or reduce flooding by isolating a stream from its flood plain. Effects of channelization and levee construction include loss of stream habitat, loss of aquatic productivity, increased stream bed and bank erosion, and a reduction of ground water levels.

Originally, the Platte and 102 rivers were sinuous, and meandered from wide to narrow alluvial valleys. However, most of the channels through the wide upstream areas were straightened prior to the 1930's, but relatively few channel alterations were made in the narrower downstream valley reaches (Committee on Public Works 1965). About 250 stream miles have been lost in the Platte River basin due to channelization (Table 15; Appendix D - see Hydrology chapter), and this represents about a 20% loss in stream mileage for fourth order and larger streams. Larger streams within the basin have been channelized to a greater extent than lower order streams (Table 15; Appendix D). All sixth order and larger streams within the basin have been channelized. Seven out of the 11 fifth order streams have been channelized, while 41 of 74 fourth order streams have experienced channelization. Any flood control benefits that resulted from channelization during the 1930's is rapidly diminishing because much of the down-cutting in the basin is complete and now sedimentation and filling of the channel is occurring (USDA-SCS 1982).

Unique Habitats

Aquatic habitat throughout the Platte River basin has been degraded through channelization and erosion. Because of this habitat degradation, any substantial section of larger streams that has not been channelized or significantly affected by channelization (e.g., downcutting) should be considered unique. Coarse substrate within streams is also rare, and therefore, it could also be considered unique where it occurs. Castile Creek, located in the lower portion of the basin, was listed as an exceptional prairie stream due to the clear water and gravel substrate present (Currier and Smith 1988). Honey Creek was considered to be one of the better tributaries of the upper Platte River (see Pflieger memorandum dated 9-26-91), and was tentatively classified as notable. Two small waterfalls were considered notable within the basin (Kramer 1993). Rochester Falls is located on the Platte River near Rochester, Missouri (59N 34W S22), while the other unnamed waterfall is on the 102 River east of Savannah, Missouri (59N 34W S14,15). MDC owns a frontage site along the Platte River at the Rochester Falls area.

Three marshes were identified within the basin as unique (Currier and Smith 1988; Kramer 1993), primarily because marsh communities within the region are now rare due to channelization and levee construction (Currier and Smith 1988). Little Platte Marsh in Clay County (53N 33W S22) was listed as significant by Currier and Smith (1988), but this 15-acre marsh was considered to be moderately disturbed due to historic and current grazing. Two

marshes in Nodaway County were listed as notable (Kramer 1993). The first marsh (65N 35W S9) was three to four acres in size, and it was moderately disturbed with low plant diversity, likely a result of grazing. The other marsh (65N 33W S19, 20) was three acres in size and had a moderate diversity of plants. However, it was considered moderately disturbed because of being surrounded by crop fields and having a power line crossing the west side.

Improvement Projects

Only one improvement project has been completed within the Platte River basin. It is located on an unnamed tributary of Castile Creek (57N 32W S4, 9) in DeKalb County. The project, completed in 1994, included 150 to 200 feet of cedar tree revetment along the streambank for stabilization and 1.4 miles of fencing to exclude cattle from the stream. However, the MDC "Streams for the Future" program will likely generate some new improvement projects within the basin. This program consists of three components: stream / watershed restoration, alternative livestock watering sources, and stream stewardship agreement. All three components are designed to improve water quality and overall stream health.

Stream Habitat Assessment

Stream habitat was assessed at three sites (Figure hs) in the Iowa portion of the basin by Iowa Department of Natural Resources personnel using a metric type index based on flow, substrate diversity, pool-riffle frequency, channel alterations, bank stability, bank cover, and influence of waste water treatment facilities on streamflow or habitat. Based on these criteria, habitat at all three sites was classified as fair.

Stream habitat was described qualitatively within the Missouri portion of the Platte River basin at the 18 sites (Figure hs) sampled for fish community composition in 1995 and 1996. The homogenous habitat conditions throughout the basin allowed generalizations to be made with regard to stream habitat conditions within the basin. Streambanks along channelized reaches were highly susceptible to erosion (bank stability ranked as fair to poor) resulting in poorly vegetated (generally herbaceous vines with shallow root systems), high vertical stream banks. In areas that were not channelized, streambanks generally were more stable (usually had stability ranking of good), and over 50% of the streambank vegetation consisted of trees and shrubs.

Most streams throughout the basin have little or no woody stream corridor. None of the sites surveyed had a 100 feet wide wooded corridor, and most had less than 50 feet width of woody vegetation along either streambank. Fencing of the stream corridor was rare. When cattle were present they usually had free access to the streams causing further habitat degradation. Land use at over half of the sites surveyed consisted entirely of row crop production, and crops were often planted up to the edge of the streambank. Land use at the remaining sites consisted of 20 to 50% pastured areas with the remaining land generally in row crop production.

Channel conditions throughout the basin were generally poor. Channelization and siltation have eliminated much of the riffle-pool complex in most of the streams within the basin. Loss of quality pool habitats, large woody debris, and riffles, are serious habitat related problems in the Platte River basin. Elimination of this habitat has likely resulted in the decrease of fish production throughout the basin. Instream habitat was lacking. Instream habitat usually consisted

of a small root wad or a tree in channelized sections with larger amounts of woody cover in unchannelized sections. Substrates varied at each of the sampling sites, but sand generally dominated substrate composition at all sites. Silt and clay substrates were also relatively common substrates. When larger substrate was present, it was often covered with silt, and interstitial areas were often reduced or eliminated due to siltation.

Table 15. Miles of stream channelization for fourth order and larger streams within the Platte River basin.

Order	Total Number of Streams	Number of Streams Unaltered	Original Miles	Current Miles	Miles Lost to Channelization (% of orig.)	Current Miles Channelized (% of current)	Current Miles Unchannel- ized (% of current)
8	1	0	281.1	195.5	85.6 (30.5)	89.9 (46.0)	105.6 (54.0)
7	1	0	53.1	41.8	11.3 (21.2)	18.5 (44.3)	23.3 (55.7)
6	3	0	206.2	175.9	30.3 (14.7)	45.3 (25.8)	130.6 (74.2)
5	11	4	269.5	227.1	42.4 (15.7)	53.1 (23.4)	174.0 (76.6)
4	74	33	664.0	583.7	80.3 (12.1)	102.6 (17.6)	481.1 (82.4)

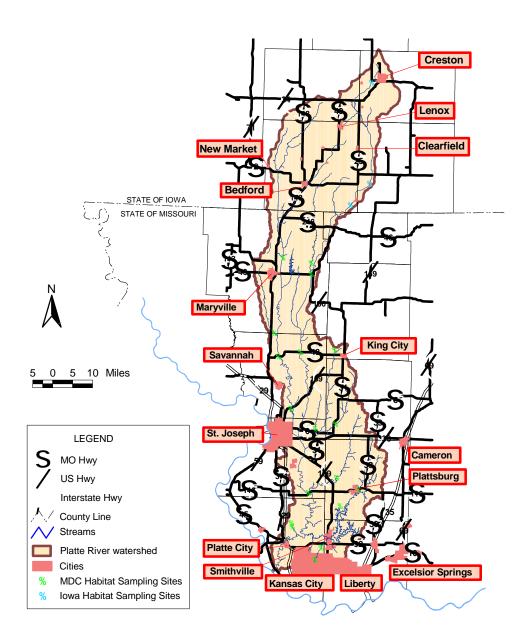


Figure hs. Habitat sampling sites within the Platte River basin in Missouri and Iowa.